

WA 2917 3a

11/31/1994

RCRA PERMIT
ADMINISTRATIVE RECORD
ITEM NUMBER
TOTAL NUMBER OF PAGES

NOVEMBER 3, 1994

TO:MR. DAVID CROXTON
HW-106

FROM:ROBERT FARRELL

SUBJECT:REVIEW OF DRAFT PERMIT LANGUAGE--PIER 91

PARA. III.E.3--"...shall not be performed in conjunction with any other well sampling." Apparently a distinction is being made between pre-corrective action monitoring and the pre-remediation monitoring. It appears that the intent of this paragraph is to indicate that the lower aquifer wells will be sampled for at least two quarters no matter what other monitoring frequencies are applied to other wells.

PARA. III.F.a--Recommend that CP-109 added to wells that should be included in capture zone.

TABLE III-2--Recommend that the elevation of Lake Jacob be included with the measurement of the level A wells. It is recommended that CP-122B and 106B be included on the same monitoring schedule as the other wells.

Since the majority of the deep wells (B) are tidally influenced, it is necessary to obtain continuous recordings of the water levels over several tidal cycles in order to obtain an average head during the period. It is this average head that should be used to determine the direction of the ground water flow in the deeper wells. It is not expected that the deeper ground water should be influenced to the same degree the shallower wells are influenced by seasonal changes. It is recommended that the continuous recording intervals for the deeper wells be done quarterly rather than monthly. The elevation of Elliott Bay nearest BEI property should be continuously recorded for the same period as the deeper wells.

The shallower ground water flow has been shown to be highly variable in direction. Mounding has been indicated to occur at times in various places. BEI has yet to make any demonstration of what caused these changes in ground water flow directions nor why the mounding in the water table changes locations from time to time. It is recommended the monthly water level recording be continued and not go to quarterly measurements until the causes of the variable ground water conditions are understood. This variability of flow direction and mounding will have to be accounted for in any designing of the ground water capture system designed to prevent the continuing migration of the contaminants off site.

At the same time that water level measurements are made BEI

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should provide the precipitation data for the periods preceding each water level measurement. BEI should also check its records for water usage on its property and provide the records of water usage during the period preceding each water level measurement. This data should be tabulated and graphed for comparison to the hydrographs for each well in the shallow and deep parts of the aquifer.

QUESTION 5--It is agreed that if new samples from the deeper aquifer are clean after a year of sampling, it can be concluded that the earlier detections were related to cross contamination.